Space Weather Forecast

Issued on Tuesday 21 January 2025 at 00:53 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate class flares likely with a slight chance of X-class (Strong) flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low, with a peak flare at 20/1315 UTC from AR3968. AR3961 remains the largest sunspot group. A growth trend is evident, yet flare activity remains largely muted, however, the magnetic configuration of the sunspot is complex. AR3964 and AR3959, are both moderately sized spots in the northeast, neither of which have shown any significant change in recent hours. Confidence in the magnetic configuration of AR3968 is low, given increased foreshortening as it approaches the western horizon. All remaining spots are small and have shown little change.

No clear Earth-directed coronal mass ejections have been observed, though a filament eruption from the SE around 20/1954UTC is under review.

Solar Wind / Geomagnetic Activity: Ongoing fast winds from a coronal hole were observed. Solar wind speed increased from slightly elevated to become strong, reaching 600-650km/s by the end of the period. Interplanetary Magnetic field, Bt, was Weak to Moderate with the north-south component also Weak to Moderate, with no single orientation (direction) favoured. Geomagnetic activity was Quiet to Active (Kp2-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at Background with no Solar Radiation Storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is forecast, with isolated Moderate-class flares likely. There is a slight chance of Strong flares.

Solar Wind / Geomagnetic Activity: There are no coronal mass ejection arrivals expected at Earth, however a glancing impact from the coronal mass ejection early on 18 Jan cannot be completely ruled out early day 1 (21 Jan). Otherwise, current strong fast winds from CH09/- are expected to continue before gradually easing, likely becoming near background by the end of day 3 (23 Jan). Mainly Quiet to Unsettled geomagnetic activity is expected, with a chance of Active intervals day 1 (21 Jan).

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at Background with no Solar Radiation Storms occurring. However, there is a slight chance of this rising in response to any significant flares that occur.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	70	70	70	60
Very Active	R3-R5 (X Class)	No	20	20	20	15

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	20	20
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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